

# Patient Satisfaction with Wait-Times for Breast Cancer Surgery in Newfoundland and Labrador

## Satisfaction de la patiente quant au temps d'attente pour une chirurgie du cancer du sein à Terre-Neuve-et-Labrador



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### Abstract

Do shorter waits for breast cancer surgery lead to greater wait-related patient satisfaction? Using survey and cancer clinic chart data of 99 patients with breast cancer from Newfoundland and Labrador, we found that median wait-time from first visit to a surgeon to surgery was 22.0 days and 87% were satisfied with their wait-time. Wait-related satisfaction was not associated with the length of wait but rather with the stage, severity of treatment, wait-time for a diagnosis and satisfaction with diagnosis-related wait. These findings highlight the importance of an early and timely diagnosis in patients' perceptions of breast cancer care wait-times.

## Résumé

Des temps d'attente plus courts pour une chirurgie du cancer du sein donnent-ils lieu à une plus grande satisfaction de la patiente quant aux temps d'attente? Au moyen d'un sondage et des données de références cliniques auprès de 99 patientes atteintes du cancer du sein à Terre-Neuve-et-Labrador, nous avons observé que le temps d'attente médian entre la première consultation chez le chirurgien et la chirurgie était de 22,0 jours; 87 % des patientes se disaient satisfaites du temps d'attente. La satisfaction quant au temps d'attente n'était pas liée à la durée de l'attente mais plutôt au stade du cancer, à la sévérité du traitement, au temps d'attente pour le diagnostic et à la satisfaction quant au temps d'attente pour obtenir le diagnostic. Ces résultats soulignent l'importance d'un diagnostic précoce et opportun dans la perception des patientes face aux temps d'attente pour obtenir des soins liés au cancer du sein.

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**W**AIT-TIMES FOR CANCER CARE HAVE RECEIVED MUCH ATTENTION FROM THE media and researchers. Prompted by the 2004 Health Accord, provincial governments began to post wait-times online for the priority conditions. Today, most Canadian provinces now post wait-time data for a variety of surgical and diagnostic procedures, including breast cancer surgeries (CIHI 2014; Wait Time Alliance 2014). Some of the sites allow the public to view region- or hospital-specific wait-time data.

A number of studies from Canada and elsewhere have described wait-times for breast cancer surgery (Gorey et al. 2009; Mayo et al. 2001; Olson and de Gara 2002; Reed et al. 2004; Simunovic et al. 2001, 2005). Researchers have examined outcomes related to wait-times and have found that excessive wait-times (greater than 12 weeks) for surgery were associated with poorer outcomes (Richards and Smith et al. 1999; Richards and Westcombe et al. 1999; Shin et al. 2013; Vujovic et al. 2009; Wagner et al. 2011). Although shorter wait-times are believed intuitively to lead to better wait-satisfaction, few studies in Canada have assessed the satisfaction of patients with breast cancer in relation to their wait-time experiences.

Using data from patient surveys and chart reviews, we examined the relationship between wait-times from first visit with a surgeon to surgery and wait-related satisfaction among patients with breast cancer in Newfoundland and Labrador. Specifically, we compared the wait-related satisfaction between patients with longer and those with shorter than average waits between first visit to a surgeon and surgery. We hypothesized that patients with shorter than average waits would be more satisfied than patients with longer than average waits. The study is part of a larger project examining patient perceptions of wait-times for cancer care. The study contributes to the understanding of public perceptions of wait-times and identifies ways of improving the timeliness of cancer care.

## Methods

The Newfoundland and Labrador Health Research Ethics Board approved of this study (HIC reference 09.37). We recruited patients presenting at regional cancer clinics across the province (St. John's, Gander, Grand Falls-Windsor and Corner Brook) and at Daffodil Place (the provincial cancer lodge). We also mailed study invitations to patients who were identified through the provincial cancer registry. These invitations asked interested patients to contact a research assistant to arrange for an interview.

The study used a retrospective design and recruited patients who had already been diagnosed with cancer and had either started or completed their treatment regimen. To be eligible for the larger study, patients had to be residents of Newfoundland and Labrador; 19 years of age or older; fluent in English; seeking or receiving treatment for their first cancer diagnosis; and diagnosed with breast, lung, colorectal or prostate cancer between 1 January 2009 and 30 June 2011. We excluded male patients with breast cancer and patients with multiple cancer diagnoses. In this article, we examine patients with breast cancer who underwent surgery as their primary form of treatment (as specified in their cancer clinic medical chart), had undergone surgery before other forms of treatment, knew the date of first visit to their surgeon and consented to the chart review.

Research assistants screened individuals for eligibility, obtained consent and conducted in-person surveys with patients. The research assistants received extensive training and used scripted prompts and visual aids (e.g., calendars for reference) during the interviews. The survey instrument was written in English at a Grade 8 level and included questions related to eligibility, dates in the care-seeking process (e.g., the onset of symptoms, first presentation to a healthcare provider, etc.), clinical and screening history and socio-demographic characteristics. In addition, respondents were asked to rate their satisfaction with specific wait-time intervals (e.g., from first visit with a surgeon until surgery, etc.) using a five-point Likert scale, where one was "not at all satisfied" and five was "very satisfied". A chart audit tool was used to review cancer clinic medical charts of surveyed patients. The audit tool gathered data of demographic characteristics (e.g., date of birth, community of residence, etc.), stage, availability of and completeness of needed clinical information (e.g., date of pathology report, diagnostic tests) and treatment (types, priority rating, date and site of initial consultation and start of treatments, etc.).

The items included in the survey and chart reviews were identified and selected based on in-depth literature reviews and consultations with cancer care providers, patients with cancer and representatives from the provincial division of the Canadian Cancer Society. In addition, we also conducted extensive pre-testing with patients and cancer care providers to ensure the face validity and comprehensibility of the questions prior to administering the survey. This pre-testing resulted in changes to the wording and ordering of questions, but not to the actual content of the instrument. We also pre-tested the chart audit forms to ensure that data were available in the charts and could be efficiently gathered. For example, the items were listed on the chart audit tool in the order of their appearance in the chart and described using the same terminology.

Survey and chart data were entered into a database using SPSS data entry software and analyzed using IBM SPSS Statistics software (version 20.0; IBM, Armonk, NY, USA). Data entry errors were identified using frequencies and cross-tabulations, and original surveys and chart reviews were consulted to correct errors. To assess the representativeness of the sample, we used chi-square tests to compare the age and community of residence of respondents to the data provided by the Cancer Registry (used to mail out study invitations).

The primary outcome considered in the analysis was satisfaction with the waiting time from first visit with a surgeon until surgery. Wait-related satisfaction was based on the question “Using a scale where 1 is ‘Very Dissatisfied’ and 5 is ‘Very Satisfied’, in general, how satisfied are you with the time from your first visit with a surgeon to the time of your surgery?” Because data were skewed, the variable was recoded into two categories: dissatisfied (responses 1–3) and satisfied (responses 4–5).

The independent variable was length of waiting time from first visit with a surgeon until surgery. The wait-time was calculated by subtracting the date of surgery (taken from the chart) from the date given in response to the survey question “When did you first see a surgeon?” Because the data were skewed, the variable was grouped into two categories: shorter than average wait (equal to or less than the median wait-time) and longer than average wait (greater than the median wait-time).

Other variables considered in the analyses included socio-demographic characteristics (age, community of residence, marital status, employment status and income), family history of cancer and cancer- and treatment-related characteristics (number of diagnostic tests, stage, type of surgery and location of surgery). Stage of cancer was coded into either early stage (0,1) or late stage (2,3,4). We also included variables on wait-time from first visit to a healthcare provider to diagnosis and satisfaction with this wait-time because preliminary analyses suggested that the wait-time for diagnosis may overlap with the wait-time from first visit to a surgeon and/or surgery (that is, a cancer diagnosis may only have been confirmed after consulting a surgeon or after having undergone surgery). The wait-time from first visit to a healthcare provider to diagnosis was calculated from the questions: “When did you first see a healthcare professional about these symptoms/screening results?” and “When did someone tell you that you definitely had cancer?”, and were coded as shorter than average wait (equal to or less than the median wait-time) and longer than average wait (greater than the median wait-time). Wait-time satisfaction was based on the question “Using a scale where 1 is ‘Very Dissatisfied’ and 5 is ‘Very Satisfied’, in general, how satisfied are you with the time from your first visit to a healthcare provider until you were told you definitely have cancer?” and coded as dissatisfied (responses 1–3) and satisfied (responses 4–5).

After describing the characteristics of the sample, we used chi-square tests (or Fisher’s exact tests, if applicable) to detect differences between patients with shorter and those with longer than average surgery wait-times and between patients who were satisfied and those who were unsatisfied with surgery wait-times. In supplementary analyses, we repeated this after removing outliers from the sample to assess the impact of extreme wait-times.

We used multiple logistic regression to identify significant ( $p < 0.05$ ) predictors of satisfaction with surgery-related wait-time. We selected potential predictor variables for the regression model on the basis of the chi-square tests. We decided the final model on the basis of change in the  $-2 \log$  likelihood value (Osborne 2015).

## Results

There were 652 patients who expressed interest in the study; 383 of these patients were eligible. Further, 335 (87.5%) of the 383 eligible patients completed the survey. We asked participants about cancer type during the survey and found 122 women to have breast cancer. We excluded 10 women who did not consent to a chart review, seven women who did not know when they first visited a surgeon and six women who had undergone surgery after some other form of treatment, thereby leaving 99 patients in the study. Characteristics of the study sample are shown in Table 1. The sample over-represented women under 65 years as well as urban residents (Table 1).

**TABLE 1.** Sample representativeness of patients with breast cancer

	Population* N (%)	Sample N (%)	p-value
<b>Age (years)</b>			<0.05
Under 65	252 (64.1)	87 (87.9)	
65 and over	141 (35.9)	12 (12.1)	
<b>Community of residence</b>			<0.05
Urban (>10,000 population)	165 (41.7)	50 (50.5)	
Rural (<10,000 population)	231 (58.3)	49 (49.5)	

\*Numbers are based on cancer registry data provided for the study; the sample includes all eligible patients with breast cancer (including those who did not undergo surgery as primary treatment).

Most of the patients in the study were under the age of 65 years (mean 55.20 years, median 56.0 years, standard deviation 9.74 years, range: 33–79 years). The majority of patients with breast cancer in the sample were married or equivalent, were educated with a high school diploma or more, had early-stage breast cancer and were satisfied with their waiting time from first visit to a healthcare provider to diagnosis and from first visit with a surgeon to having undergone surgery (Table 2). The most common surgical procedures were partial and total mastectomy.

The median wait-time from first visit with a surgeon to having undergone surgery was 24.5 days. The range was 0–214 days with a 90<sup>th</sup> percentile of 120.5 days. There were no differences in the proportion of patients with longer than and those with shorter than average wait-times among any of the variables considered, with the exception of wait-time from first visit to a healthcare provider and that for diagnosis (Table 3). Compared to patients

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with shorter than average wait-times for surgery, a larger proportion of patients who had longer than average waits for surgery also had longer than average waits for a diagnosis. After excluding outliers, similar differences were found between women with long and short waits.

**TABLE 2.** Characteristics of eligible patients with breast cancer

Characteristics	N* (%)	Characteristics	N* (%)
<b>Age (years)</b>		<b>Number of diagnostic tests taken</b>	
Under 65	87 (87.9)	1–2 tests	19 (19.2)
65 and over	12 (12.1)	3 tests	48 (48.5)
<b>Community of residence</b>		4 + tests	32 (32.3)
Urban	50 (50.5)	<b>Stage of cancer</b>	
Rural	49 (49.5)	Early stage (0, 1)	67 (77.0)
<b>Marital status</b>		Late stage (2,3,4)	20 (23.0)
Married or equivalent	81 (81.8)	<b>Type of surgery performed</b>	
Single	18 (18.2)	Partial mastectomy	43 (43.9)
<b>Employment</b>		Total mastectomy	40 (40.8)
Full-time work	20 (20.2)	Bilateral mastectomy	9 (9.2)
Part-time/seasonal	14 (14.1)	Axillary dissection	4 (4.1)
Sick leave	23 (23.2)	Sentinel lymph node biopsy	2 (2.0)
Unemployed/homemaker/student	16 (16.2)	<b>Location of surgery</b>	
Retired	26 (26.3)	St. John's	45 (46.4)
<b>Education</b>		Regional hospital in NL	49 (53.6)
Completed high school or less	39 (39.8)	Regional hospital outside NL	0 (0)
More than high school	59 (60.2)	<b>Waiting time HCP – Diagnosis</b>	
<b>Income</b>		Shorter than average waiting time	45 (47.9)
Less than \$30,000	18 (20.0)	Longer than average waiting time	49 (52.1)
\$30,000–\$59,999	34 (37.8)	<b>Satisfaction HCP – Diagnosis</b>	
More than \$60,000	38 (42.2)	Unsatisfied	29 (29.6)
<b>Family history of any cancer</b>		Satisfied	69 (70.4)
Yes	74 (75.5)	<b>Satisfaction surgeon – Surgery</b>	
No	24 (24.5)	Unsatisfied	14 (14.4)
		Satisfied	83 (85.6)

\*Numbers may not add to 99 because of missing answers; HCP = healthcare provider; NL = Newfoundland and Labrador.

**TABLE 3.** Surgery-related wait-times and wait-related satisfaction among patients with breast cancer

Characteristics	Surgery Wait-Time*			Surgery Wait Satisfaction*		
	Shorter Than Average Wait (N = 50) n (%)	Longer Than Average Wait (N = 49) n (%)	p-value	Unsatisfied (N = 14) n (%)	Satisfied (N = 83) n (%)	p-value
<b>Age (years)</b>			0.970			0.372
Under 65	44 (88.0)	43 (87.8)		11 (78.6)	74 (89.2)	
65 and over	6 (12.0)	6 (12.2)		3 (21.4)	9 (10.8)	
<b>Community of residence</b>			0.269			0.231
Urban	28 (56.0)	22 (44.9)		5 (35.7)	44 (53.0)	
Rural	22 (44.0)	27 (55.1)		9 (64.3)	39 (47.0)	
<b>Marital status</b>			0.570			0.261
Married or equivalent	42 (84.0)	39 (79.6)		10 (71.4)	70 (84.3)	
Single	8 (16.0)	10 (20.4)		4 (28.6)	13 (15.7)	
<b>Employment</b>			0.266			0.815
Full-time work	8 (16.0)	12 (24.5)		2 (14.3)	18 (21.7)	
Part-time/seasonal	9 (18.0)	5 (10.2)		1 (7.1)	13 (15.7)	
Sick leave	15 (30.0)	8 (16.3)		4 (28.6)	18 (21.7)	
Unemployed/homemaker/ student	6 (12.0)	10 (20.4)		3 (21.4)	12 (14.5)	
Retired	12 (24.0)	14 (28.6)		4 (28.6)	22 (26.5)	
<b>Education</b>			0.966			0.854
Completed high school or less	20 (40.0)	19 (39.6)		6 (42.9)	33 (40.2)	
More than high school	30 (60.0)	29 (60.4)		8 (57.1)	49 (59.8)	
<b>Income</b>			0.767			0.515
Less than \$30,000	9 (19.6)	9 (20.5)		4 (30.8)	13 (17.3)	
\$30,000–\$59,999	19 (41.3)	15 (34.1)		4 (30.8)	30 (40.0)	
More than \$60,000	18 (39.1)	20 (45.5)		5 (38.5)	32 (42.7)	
<b>Family history of any cancer</b>			0.410			0.316
Yes	36 (72.0)	38 (79.2)		9 (64.3)	63 (76.8)	
No	14 (28.0)	10 (20.8)		5 (35.7)	19 (23.2)	
<b>Number of diagnostic tests taken</b>			0.075			0.359
1–2 tests	12 (24.0)	7 (14.3)		1 (7.1)	18 (21.7)	
3 tests	27 (54.0)	21 (42.9)		7 (50.0)	41 (49.4)	
4+ tests	11 (22.0)	21 (42.9)		6 (42.9)	24 (28.9)	

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Characteristics	Surgery Wait-Time*			Surgery Wait Satisfaction*		
	Shorter Than Average Wait (N = 50) n (%)	Longer Than Average Wait (N = 49) n (%)	p-value	Unsatisfied (N = 14) n (%)	Satisfied (N = 83) n (%)	p-value
<b>Stage of cancer</b>			0.232			0.001
Early stage (0,1)	37 (82.2)	30 (71.4)		6 (42.9)	61 (85.9)	
Late stage (2,3,4)	8 (17.8)	12 (28.6)		8 (57.1)	10 (14.1)	
<b>Type of surgery performed</b>			0.338			0.022
Partial mastectomy	24 (48.0)	19 (39.6)		1 (7.7)	42 (50.6)	
Total mastectomy	20 (40.0)	20 (41.7)		9 (69.2)	30 (36.1)	
Bilateral mastectomy	3 (6.0)	6 (12.5)		2 (15.4)	6 (7.2)	
Axillary dissection	1 (2.0)	3 (6.2)		0 (0)	4 (4.8)	
Sentinel lymph node biopsy	2 (4.0)	0 (0)		1 (7.7)	1 (1.2)	
<b>Location of surgery</b>			0.936			0.386
St. John's	23 (46.0)	22 (46.8)		5 (35.7)	40 (48.2)	
Regional hospital in NL	27 (54.0)	25 (53.2)		9 (64.3)	43 (51.8)	
Regional hospital outside NL	0 (0)	0 (0)		0 (0)	0 (0)	
<b>Waiting time HCP – Diagnosis</b>			0.002			0.042
Shorter than average waiting time	30 (63.8)	15 (31.9)		3 (21.4)	41 (52.6)	
Longer than average waiting time	17 (36.2)	32 (68.1)		11 (78.6)	37 (47.4)	
<b>Satisfaction HCP – Diagnosis</b>			0.269			0.003
Unsatisfied	12 (24.5)	17 (34.7)		9 (64.3)	20 (24.4)	
Satisfied	37 (75.5)	32 (65.3)		5 (35.7)	62 (75.6)	
<b>Wait-time surgeon – Surgery</b>			–			0.900
Shorter than average waiting time	–	–		7 (50.0)	43 (51.8)	
Longer than average waiting time	–	–		7 (50.0)	40 (48.2)	

\*Numbers may not add to 99 because of missing answers; HCP = healthcare provider, NL = Newfoundland and Labrador.

A large majority (86.3%) of patients with breast cancer said that they were satisfied with their wait-time from first visit with a surgeon to having undergone surgery. Compared with those who were satisfied, a larger proportion of unsatisfied patients had late-stage cancer, had either a total or bilateral mastectomy, had longer wait-times for diagnosis and were unsatisfied with their wait-time for diagnosis. There were no other significant differences between



satisfaction with surgery-related wait-times, amongst those with longer than average and those with shorter than average wait-times for surgery. After excluding outliers, compared with those who were satisfied, a larger proportion of unsatisfied patients had late-stage cancer, had either a total or bilateral mastectomy and were unsatisfied with their wait-time for diagnosis. There was no significant difference in satisfaction with surgery-related wait-times and diagnosis-related wait-times.

Logistic regression showed that women with late-stage breast cancer were 8.33 times less likely (based on the inverse of 0.12) to be satisfied with their surgery-related wait-time than women with early-stage breast cancer (Table 4). Given the small sample size, the number of variables that we could include in the regression model was limited.

**TABLE 4.** Predictors of surgery-related wait times and wait-related satisfaction among patients with breast cancer

Variable	Satisfied with Surgery Wait OR (95% CI)
<b>Stage of cancer</b>	
Early stage (0,1)	1.00
Late stage (2,3,4)	0.12 (0.04, 0.43)

OR = odds ratio; 95% CI = 95% confidence interval.

## Discussion

We linked patient survey and chart data to examine the association between wait-time from first visit to a surgeon until surgery and wait-related satisfaction for patients with breast cancer in Newfoundland and Labrador. Contrary to our hypothesis, shorter wait-times for surgery did not produce greater interval-specific satisfaction. Instead, we found that satisfaction with wait-time for surgery was associated with the severity of the diagnosis and treatment and satisfaction with diagnosis-related waits. Although there was no difference in the wait-time of women with early- and late-stage breast cancer, women with late-stage cancer were more likely to be unsatisfied with their surgery-related wait-time. Likewise, a larger proportion of women who had either total or bilateral mastectomies were unsatisfied with surgery-related wait-times even though there was no difference in wait-times. Women with late-stage cancers or those requiring more severe treatments may believe that their wait-time to see a surgeon may have contributed to their disease progression. A significantly larger proportion of (75%) of women with late-stage cancer than early-stage cancer (41%) had long wait-times (greater than median) from their first visit with a healthcare provider (for symptoms) and their first visit to a surgeon. The median wait-time was 36.50 days; mode, 18 and 30 days; mean, 88.35 days; range 0–806 days; and a 90<sup>th</sup> percentile of 253.30 days.

The influence of the diagnosis-related wait on the perception of the surgery-related wait may be due in part to the overlap between the two intervals; only 35.4% of the women

in the study knew they “definitely” had cancer before their first visit with a surgeon, and 83.8% learned of their diagnosis before their surgery. However, surgery-related wait-time and diagnosis-related wait-time is weakly correlated ( $r = 0.22$ ,  $p = 0.021$ ), so the overlap in itself does not fully explain why the wait-time for diagnosis colours the perception of the wait-time for surgery. The wait-time for diagnosis is typically the most anxious period for patients during the cancer care-seeking journey and the experiences during this interval can affect their decision-making, well-being and psychosocial outcomes during treatment and thereafter (Dore et al. 2013; Drageset et al. 2010, 2011). In a separate analysis, we examined the relationship between screening behaviours, wait-time for diagnosis and wait-related satisfaction and found that satisfaction was poorest among women who engaged in regular screening activities but whose screening activities did not detect their cancer (Mathews et al. 2014). These findings suggest that the experiences and expectations related to cancer diagnosis may have a greater impact on patients’ perception of the timeliness of surgery than the actual wait-time itself.

The surgery-related wait-times reported by women in this study are longer than the wait-times reported by the Newfoundland and Labrador wait-times (Newfoundland and Labrador Department of Health and Community Services 2014). The longer times reported in the study may be due to differences in the start date of the wait. Although the study used first visit to a surgeon, Newfoundland and Labrador, like other provinces, measures the start of the wait-time from the date that both the patient and surgeon agree to have a surgery (Newfoundland and Labrador Department of Health and Community Services 2014). Newfoundland and Labrador also only include wait-times for patients with a confirmed cancer diagnosis. As described above, roughly one in eight women only receive a confirmed diagnosis after having undergone surgery.

There were few differences in the characteristics of women with longer than average and those with shorter than average surgery-related wait-times. These findings echo findings from other studies in Canada that have found that wait-times are equitable relative to socio-demographic traits (Gorey et al. 2009; Katz et al. 1993). There was no difference in the wait-times of women with late- and early-stage cancer. Given that staging is usually done following surgery, it cannot be used to prioritize women for surgery.

### *Limitations*

Our ability to detect significant differences and conduct multivariate analyses is limited by the relatively small sample size of patients with breast cancer in the study. As a result, we may not have identified differences where they existed. Although the date of surgery was taken from the medical chart, we relied on survey data to establish the date of diagnosis and the date of first visit with a surgeon. Given the retrospective design, patients may not have accurately recalled dates. In addition, the design may influence reported satisfaction with wait-times, that is, once the stage and prognosis are better known. As a result, wait-times might not be accurate. Although a number of studies have noted that patients with cancer can reliably recall key dates in their cancer care, further research is needed to assess recall

reliability over the course of their illness (i.e., from symptom to treatment). The study examines a non-representative sample which may suffer from volunteer bias; patients with better prognoses may have been more likely to participate than those with poor prognoses, resulting in more positive perceptions of wait-times. We used a single item to capture satisfaction with each wait-time. Although there are a number of validated scales that measure satisfaction with cancer care, none of these scales captures satisfaction with wait-times as patients move across different healthcare sectors, from the onset of their symptoms through testing and various forms of treatment. Based on the results of these initial studies, we have identified dimensions of a wait-related satisfaction scale (Ryan et al. 2015). Finally, the study examines patients with breast cancer from one province and this may not be generalizable to other jurisdictions. Further research is needed to confirm these findings in other provinces.

## Conclusion

Satisfaction with surgery-related wait-times was not associated with the length of the wait-time from first visit with a surgeon to surgery among patients with breast cancer in Newfoundland and Labrador. However, satisfaction with surgery-related wait-time was associated with the severity of diagnosis and treatment, and satisfaction with the wait-time for cancer diagnosis. To the best of our knowledge, this study is one of the first in Canada to explore the relationship between surgery-related wait-times and wait-related satisfaction. Despite its limitations, the study highlights the importance of early and timely diagnosis in patients' perceptions of wait-times for breast cancer surgery.

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## References

- Canadian Institute for Health Information (CIHI). 2014. *Wait Times for Priority Procedures in Canada, 2014*. Ottawa: Canadian Institute for Health Information. Retrieved July 25, 2014. <[https://secure.cihi.ca/free\\_products/2014\\_WaitTimesAiB\\_EN.pdf](https://secure.cihi.ca/free_products/2014_WaitTimesAiB_EN.pdf)>.
- Doré, C., F. Gallagher, L. Saintonge and M. Maude Hébert. 2013. "Breast Cancer Screening Program: Experiences of Canadian Women and Their Unmet Needs." *Health Care for Women International* 34(1): 34–49. doi:10.1080/07399332.2012.673656.

- Drageset, S., T.C. Lindstrom, T. Giske and K. Underlid. 2011. "Being in Suspense: Women's Experiences Awaiting Breast Cancer Surgery." *Journal of Advanced Nursing* 67(9): 1941–51. doi:10.1111/j.1365-2648.2011.05638.x.
- Drageset, S., T.C. Lindstrom and K. Underlid. 2010. "Coping with Breast Cancer: Between Diagnosis and Surgery." *Journal of Advanced Nursing* 66(1): 149–58. doi:10.1111/j.1365-2648.2009.05210.x.
- Gorey, K.M., I.N. Luginaah, E.J. Holowaty, K.Y. Fung and C. Hamm. 2009. "Wait Times for Surgical and Adjuvant Radiation Treatment of Breast Cancer in Canada and the United States: Greater Socioeconomic Inequity in America." *Clinical & Investigative Medicine* 32(3): 239–49.
- Katz, S.J., T.G. Hislop, D.B. Thomas and E.B. Larson. 1993. "Delay from Symptom to Diagnosis and Treatment of Breast Cancer in Washington State and British Columbia." *Medical Care* 31(3): 264–68.
- Mathews, M., D. Ryan, V. Gadag and R. West. 2014. "Use of Screening Tests, Diagnosis Wait Times, and Wait-Related Satisfaction in Breast and Prostate Cancer." *Current Oncology* 21(3): e441–48.
- Mayo, N., S. Scott, N. Shen, J. Hanley, M.S. Goldberg and N. MacDonald. 2001. "Waiting Time for Breast Cancer Surgery in Quebec." *Canadian Medical Association Journal* 164(8): 1133–38.
- Newfoundland and Labrador Department of Health and Community Services. 2014. *Wait Time Information – Breast Cancer Surgery*. Newfoundland and Labrador: Government of Newfoundland and Labrador. Retrieved July 25, 2014. <[http://www.health.gov.nl.ca/health/wait\\_times/waittime\\_breast\\_cancer\\_q3201112.html](http://www.health.gov.nl.ca/health/wait_times/waittime_breast_cancer_q3201112.html)>.
- Olson, D.W. and C.J. de Gara. 2002. "How Long do Patients Wait for Elective General Surgery?" *Canadian Journal of Surgery* 45(1): 31–33.
- Osborne, J.W. 2015. *Best Practices in Logistic Regression*. Thousand Oaks, CA: Sage Publications.
- Reed, A.D., R.J. Williams, P.A. Wall and P. Hasselback. 2004. "Waiting Time for Breast Cancer Treatment in Alberta." *Canadian Journal of Public Health* 95(5): 341–45.
- Richards, M.A., P. Smith, A.J. Ramirez, I.S. Fentiman and R.D. Rubens. 1999. "The Influence on Survival of Delay in the Presentation and Treatment of Symptomatic Breast Cancer." *British Journal of Cancer* 79(5/6): 858–64. doi:10.1038/sj.bjc.6690137.
- Richards, M.A., A.M. Westcombe, S.B. Love, P. Littlejohns and A.J. Ramirez. 1999. "Influence of Delay on Survival in Patients with Breast Cancer: A Systematic Review." *The Lancet* 353(9159): 1119–26. doi:10.1016/S0140-6736(99)02143-1.
- Ryan, D., M. Mathews and D. Bulman. 2015. "What Does Satisfaction with Wait Times Mean to Cancer Patients?" Canadian Centre for Applied Research in Cancer Control (ARCC) Conference, Montreal, QC; May 24–25, 2015.
- Shin, D.W., J. Cho, S.Y. Kim, E. Guallar, S.S. Hwang, B. Cho et al. 2013. "Delay to Curative Surgery Greater than 12 Weeks is Associated with Increased Mortality in Patients with Colorectal and Breast Cancer but not Lung or Thyroid Cancer." *Annals of Surgical Oncology* 20(8): 2468–76. doi:10.1245/s10434-013-2957-y.
- Simunovic, M., M.E. Theriault, L. Paszat, A. Coates, T. Whelan, E. Hlowaty et al. 2005. "Using Administrative Databases to Measure Waiting Times for Patients Undergoing Major Cancer Surgery in Ontario, 1993-2000." *Canadian Journal of Surgery* 48(2): 137–42.
- Simunovic, M., A. Gagliardi, D. McCready, A. Coates, M. Levine and D. DePetrillo. 2001. "A Snapshot of Waiting Times for Cancer Surgery Provided by Surgeons Affiliated with Regional Cancer Centres in Ontario." *Canadian Medical Association Journal* 165(4): 421–25.
- Vujovic, O., E. Yu, A. Cherian, F. Perera, A.R. Dar, L. Stitt et al. 2009. "Effect of Interval to Definitive Breast Surgery on Clinical Presentation and Survival in Early-Stage Invasive Breast Cancer." *International Journal of Radiation Oncology\*Biophysics* 75(3): 771–74. doi:10.1016/j.ijrobp.2008.11.049.
- Wagner, J.L., C.L. Warneke, E.A. Mittendorf, I. Bedrosian, G.V. Babiera, H.M. Kuerer et al. 2011. "Delays in Primary Surgical Treatment are not Associated with Significant Tumor Size Progression in Breast Cancer Patients." *Annals of Surgery* 254(1): 119–24. doi:10.1097/SLA.0b013e318217e97f.
- Wait Time Alliance. 2014. *Time to Close the Gap: Report Card on Wait Times in Canada June 2014*. Ontario: Author. Retrieved July 25, 2014. <<http://www.waittimealliance.ca/wp-content/uploads/2014/06/FINAL-EN-WTA-Report-Card.pdf>>.